PT520 Portable Shaker

User Manual

Installation, Operation & Maintenance

Table of Content

PT520 Digital Shaker Introduction

PT520 shaker is a portable calibration device. It is capable of calibrating the dynamic calibration of accelerometers, velocity sensors, vibration transmitters, and proximity probes in laboratory or in the field. PT520 has a built-in electro-magnetic shaking head that will generate vibration. The vibration can be digitally turned in acceleration, velocity or displacement with RMS, peak, or peak-peak. It can display in English or Metric unit. In addition, PT520 can supply sensor power, receive the output from the sensor and compare the sensor output vs. the standard output to obtain the standard calibration curve. PT520 is fully digitally controlled. Software is available to remotely control or display the calibration status. It can also work as an automatic vibration test device by third party program that interfaces with its standard RS232 port.

Unique Features

- ✓ **High resolution, 4 line LCD display**
- ✓ **Rechargeable battery, ready for field calibration**
- ✓ **Wide power input**
- ✓ **Digital RS232 port**
- ✓ **Phase lock vibration amplitude for long term stability**
- ✓ **Seismic Sensor calibration without external power, signal conditioner etc.**
- ✓ **Buffered output for further analysis**
- ✓ **English, Metric and RMS, peak, peak-peak available**
- ✓ **Digitally controlled high accurate frequency, amplitude, waveform**
- ✓ **Market leader with digital shaker**

Fig.1-1

What can PT520 do for you

1. Calibration of seismic sensors.

    a) Accelerometers. Constant current type.

    b) Velocity sensors. Constant current type.

2. System calibration

    a) Calibration of a vibration monitoring system with the sensors listed above

    b) Calibration of vibration transmitters with a PLC/DCS as a system

3. Frequency response calibration

4. Amplitude response calibration

5. Digital calibration with internal signal conditioner

Specification

Electrical

Display:

Four lines, 12 characters

Back light LED

System calibration:

3.0 g +/- 0.3dB @ 80 Hz. NIST traceable

Frequency response:

Acceleration: 30Hz - 1,000 Hz

Velocity: 30Hz - 1,000 Hz

Displacement: 30Hz - 1,000 Hz

(Refer to the graphics below for details).

Frequency accuracy:

30 - 1,000 Hz (± 0.5%)

Overall: 30- 2,000 Hz (un-calibrated)

Amplitude:

Maximum acceleration: 8g (78 m/s2) peak

Maximum velocity: 156 mm/s (6.1 in/s) peak

Maximum displacement: 2mm (78mil) peak-peak

Reference accelerometer:

100mV/g ± 0.15dB @ 80 Hz

Output impedance nominal 100 ohms

Power adaptor:

Input: 100 - 240VAC @1.5A

Output: 16.8VDC @ 2A

Sensor power:

Accelerometer: nominal 2.5mA constant current

Rechargeable battery:

LiH rechargeable

Capacity: 4Ah
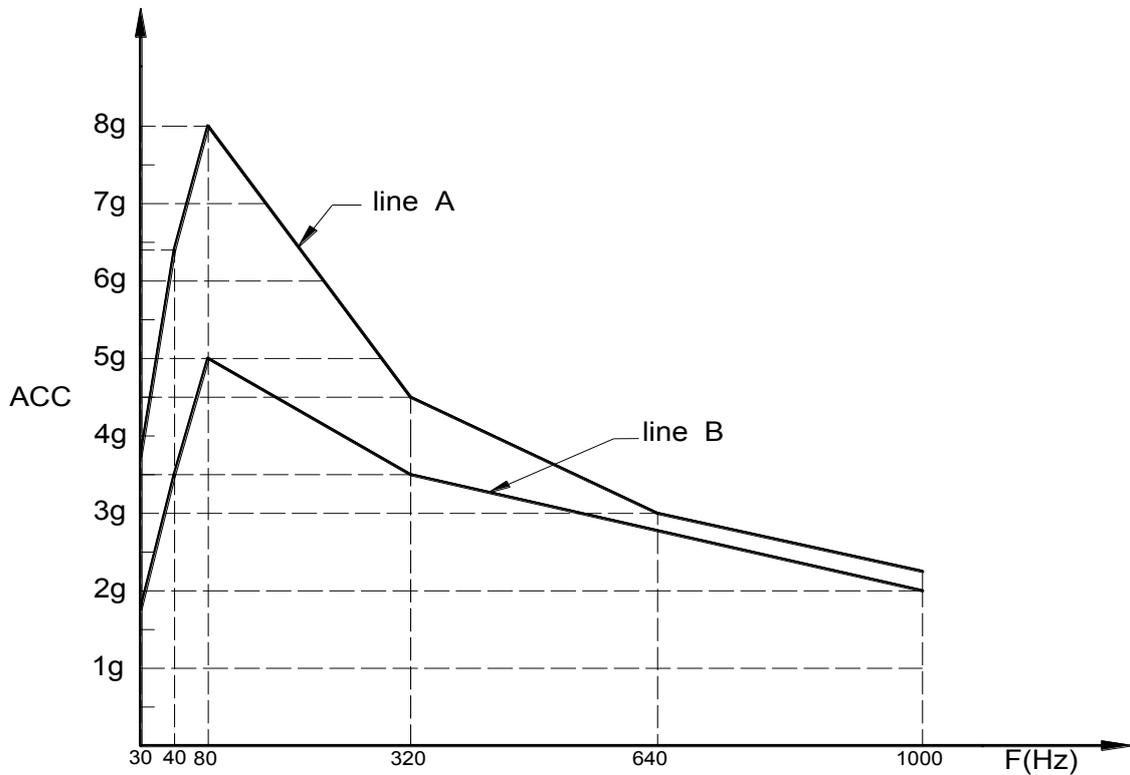
Fig.1-2

Line A: Maximum acceleration with a 125 gram load vs. frequency.

Line B: Accuracy within 0.3dB with a 125 gram load vs. frequency. The reference is 3.0g .

Notes:

✓   The shaker system is calibrated and certified with NIST traceable at 80Hz@3g.

✓   Velocity and displacement can be converted from the acceleration curve.

Vibration amplitude and output accuracy is depending on the vibration frequency, the load, the measurement unit etc. Please refer to vibration theories for the relationship among those parameters.

Physical
Dimensions:

280mm X 255mm X 175mm (11.0"x10.0"x6.9")

Weight:

8.0kg (16.0lbs)

Environmental

Operation temperature: 0°C to 50°C

Storage temperature: -20°C to 75°C

Humidity: 80% non-condensing

Before Operation

Parts that come with the shaker

a. PT520 Shaker Body 1 piece

b. Power Adaptor 1 piece

c. CD 1 piece (if it is ordered by option D00)

d. User Manual 1 piece

e. RS232 communication cable(if it is ordered by option D00)

Fig.2-1

Accessories Included with the shaker
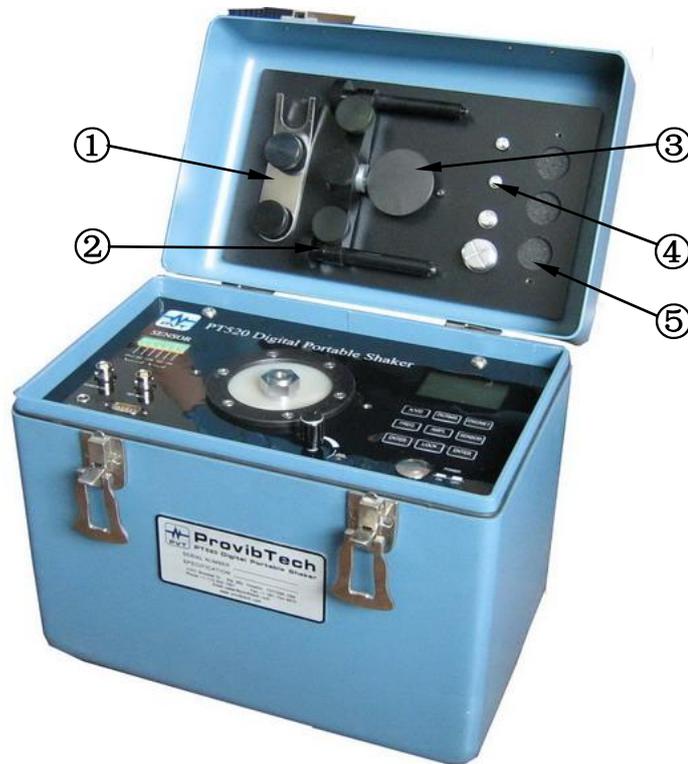
Fig.2-2

1. Wrench: refer to the number ① of the FIg.2-2, This wrench is normally used to protect the shaker head from excessive torque due to mounting and un-mounting of the seismic sensors, or target material.

2. Probe bracket: refer to the number ② of the FIg.2-2, This set is used for dynamic test of the proximity sensors.

3. AISI4140 Steel target: refer to the number ③ of the FIg.2-2, This is used for proximity sensors.

4. Mounting screws: refer to the number ④ of the FIg.2-2, are four mounting screws. The shaker head has a standard 1/4-28 threaded hold. The four mounting screws are used to adapt different seismic sensors onto the shaker head. The four adaptive screws that are included in the shaker are: 1/4-28~1/4-28, 1/4-28~M6, 1/4-28~M8, 1/4-28~M10.

5. Probe breaker: refer to the number ⑤of the FIg.2-2, are three sets of probe breakers for mounting 8mm and 11mm probes.

Sensor Installation

Installation of a seismic sensor

1. Remove the wrench on the portable shaker. Fix the shaker head with one hand and mount the seismic sensor onto the shaker head with another hand.
   Note:
   There are four different screws inside the shaker. You may just pick the one that fit the thread size on the seismic sensor. The thread on the shaker head is a standard 1/4-28 English thread. Please see the picture below.

Fig.3-1

2. Mount the sensor into the cable connector
3. Different seismic sensors have different way in connection. Be aware of that the shaker head will not withstand large torque. Minimum vertical displacement should also be maintained when connect the connectors to the sensor. If necessary, the wrench has to be fixed on the shaker head to protect it.

4. Connect the signal connector cable to monitor. Be aware of the field-wiring connection of the monitor. Please refer to supplier's manual for details.

5. To calibrate the Seismic sensor with PT520's internal circuitry, connect cable to the green connectors on the front panel of the shaker. Please refer to the paragraph below for more details.

6. Operate the shaker: Refer to the related paragraph below for details.

Fig.3-2

Installation of a proximity probe

1. Remove the ANSI4140 target from the shaker cover.
2. Mount the target on shaker head. Refer to the section of Installation of a seismic sensor for more details.
3. Mount the probe holder on the two thread holes on the right and on the left on the shaker head. Fasten the two mounting screws. Refer to the photo below. Put the proper probe bracket on the center hole of the probe holder.

Fig.3-3

4. Mount the probe into the center hole. Gap it against the target. Typical gap on the standard 8mm probe is 1.25mm or 50mi(gap voltage is around 10VDC)
5. Fasten the screws on the probe bracket. Firmly fix the probe on the shaker.
6. Connect the extension cables, the probe drivers or the probe transmitters.
7. Connect the transmitters or the drivers to monitor.
8. Start the calibration process. Refer to the following section.

Fig.3-4

PT520 Operation Instruction

Panel layout
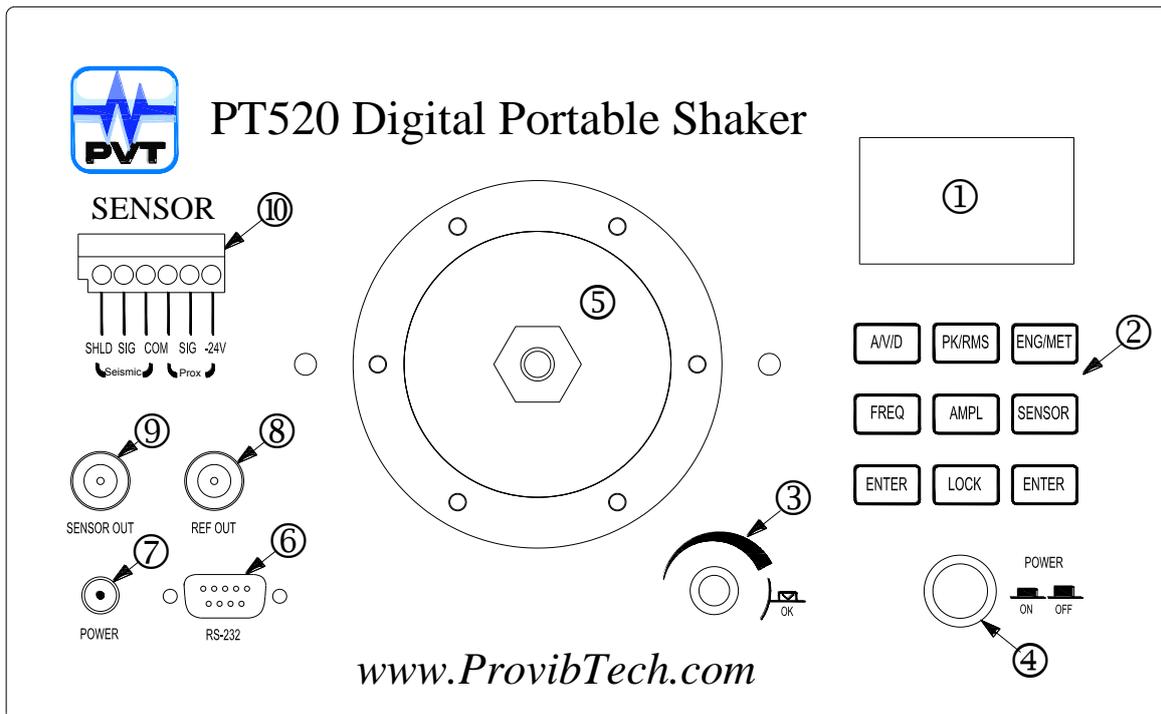
1. LCD Display
2. Keyboard
3. Tuner
4. Power Supply Switch
5. Shaker Head
6. RS232 Port
7. Power Adaptor Port
8. BNC Terminal (for Internal Sensors Buffered Output)
9. BNC Terminal (for External Sensors Buffered Output)
10. Terminals for external sensors

Fig.4-1

Introduction

LCD Display

```
          2            1
  3   ACCELERATION 🔒
  4   FREQ: 80.0 Hz
      AMPL: 0.0 g pk
  5   MODE:RUN
```
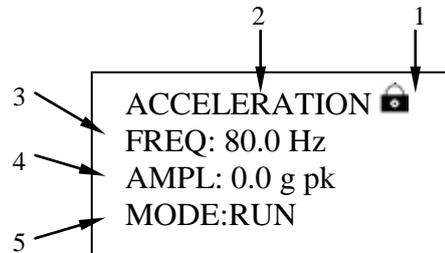
1. **Lock**. It indicates if the keyboard is locked
2. **Vibration Type**. Acceleration, Velocity or Displacement
3. **FREQ**. Current vibration frequency
4. **AMPL**. Vibration amplitude
5. **MODE**. Shaker working mode

Keyboard

A/V/D	PK/RMS	ENG/MET
FREQ	AMPL	SENSOR
ENTER	LOCK	ENTER
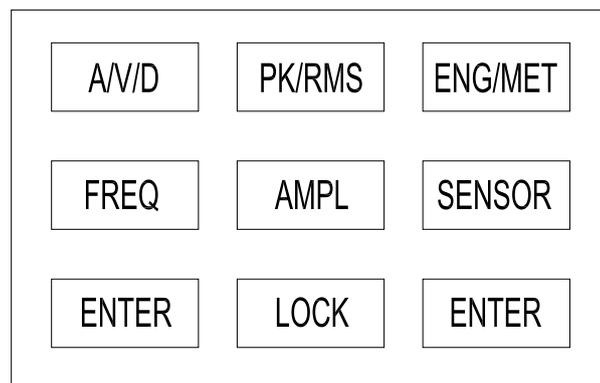
Fig.4-2

◆ A/V/D : Switch among **Acceleration**, **Velocity** or **Displacement**. Unit will be automatically converted during the switching.

◆ PK/RMS : Switch among **PK**, **PK-PK** and **RMS**. Unit will be automatically converted during the switching.

◆ ENG/MET: Switch between **English Unit** and **Metric Unit**. All other parameters will be automatically converted during the switching.

- ◆ FREQ :It is used to set **Vibration Frequency**.
- ◆ AMPL :It is used to set **Vibration Amplitude**.
- ◆ SENSOR :It is used to set **External Sensor** parameters.
- ◆ LOCK :It is used to lock the **Keyboard**.
- ◆ ENTER :Confirm Key.

Turner

- ✓ Turn clockwise to increase, counter clockwise to decrease.
- ✓ Press the Turner to change number position.

Panel Operation

Frequency Setting

- ✓ Press FREQ to enter frequency setting mode. LCD display will look like this.

```
ACCELERATION
FREQ: 0080.00 Hz
AMPL: 0.0 g   pk
MODE:RUN
```

- ✓ Press the Turner to change number position. Rotate the turner clockwise to increase the number, and vice versa. Press ENTER to confirm. LCD display will look like this.

```
ACCELERATION
FREQ: 80.0 Hz
AMPL: 0.0 g   pk
MODE:RUN
```

Amplitude Setting

- ✓ Press AMPL to enter amplitude setting mode. LCD display will look like this.

```
        ACCELERATION
FREQ: 80.0 Hz
AMPL: 05.00 g  pk
MODE:RUN
```

✓ Press the Turner to change number position, rotate the bar clockwise to increase the number, and vice versa. Press ENTER to confirm. LCD display will look like this.

```
        ACCELERATION
FREQ: 80.0 Hz
AMPL: 5.0 g  pk
MODE:RUN
```

✓ After the amplitude setting confirmed, PT520 will begin to shake with the current setting. Please refer to below picture.

```
        ACCELERATION
FREQ: 80.0 Hz
AMPL: 5.0 g  pk
MODE:RUN
```

✓ The FREQ and AMPL will be displayed in real time after shaker is in vibration mode.
✓ Modify Amplitude: During the vibration, you may change amplitude anytime with the Turner. LCD display will look like this.

```
        ACCELERATION
FREQ: 80.0 Hz
AMPL: 03.00 g  pk
MODE:RUN
```

Acceleration, Velocity, Displacement Setting

✓ Switch among Acceleration, Velocity, or Displacement by pressing A/V/D. For

example, the current status is Acceleration at 3g, after press A/V/D, it will switch to Velocity and LCD display will look like this.

```
VELOCITY
FREQ:80.0Hz
AMPL: 58.5 mm/s pk
MODE:RUN
```

✓ When current status is Velocity, presses A/V/D, it will switch to Displacement and LCD display will look like this.

```
DISPLACEMENT
FREQ: 80.0 Hz
AMPL: 232 um   pp
MODE:RUN
```

✓ When current status is Displacement, presses A/V/D, it will switch to Acceleration and LCD display will look like this.

```
ACCELERATION
FREQ: 80.0 Hz
AMPL: 3.0 g   pk
MODE:RUN
```

PK, PK-PK, RMS Setting

✓ When in Acceleration or Velocity status, default setting is PK. When in Displacement status, default setting is PK-PK.

✓ User may switch among PK, PK-PK, or RMS by pressing PK/RMS .Switching order will be like below picture(from left to right):

```
ACCELERATION
FREQ: 80.0 Hz
AMPL: 5.0 g  pk
MODE:RUN
```

```
ACCELERATION
FREQ: 80.0 Hz
AMPL: 10.0 g  pp
MODE:RUN
```

```
ACCELERATION
FREQ: 80.0 Hz
AMPL: 3.53 g  rms
MODE:RUN
```

Metric Unit and English Unit Setting

✓ User may switch between Metric Unit and English Unit by pressing
ENG/MET . LCD display will look like this.

```
    VELOCITY
FREQ: 80.0 Hz
AMPL: 50 mm/s  pk
MODE:RUN
```

```
    VELOCITY
FREQ: 80.0 Hz
AMPL: 1.96 in/s  pk
MODE:RUN
```

Lock

✓ Press LOCK , all the keys except the LOCK button itself will be locked. When
LOCK activated, LCD will display a tiny lock picture 🔒.

✓ Press LOCK again, all the keys of keyboard will be un-locked.

✓ When the keyboard is locked and user pressed any keys except LOCK, then
LCD display will be like this.

```
ACCELERATION 🔒
     LOCK
AMPL: 5.0 g pk
MODE:RUN
```

1 second later, the LCD will get back to below picture status:

```
ACCELERATION 🔒
FREQ: 80.0 Hz
AMPL: 5.0 g  pk
MODE:RUN
```

Automatic Sensor Calibration

Terminals for external sensors

SENSOR

SHLD SIG COM SIG -24V

Seismic   Prox
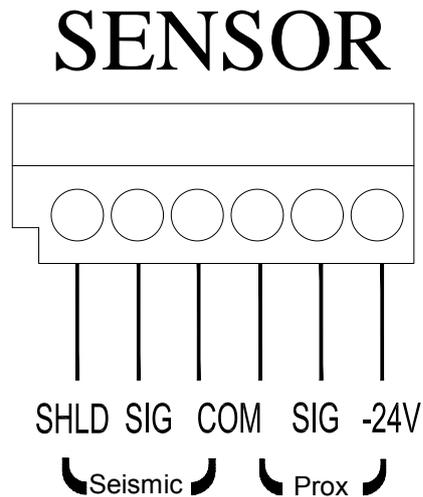
Fig.5-1

Calibration Procedures

Note: the signal conditioner is only available for ICP type sensors.

Mount sensor onto the shaker. Refer the section above.

✓ For Seismic sensors, connect the cables from the sensor to the connectors marked "Seismic" directly.

✓ The connector marked "SHLD" is for the shield wire. It can be connected to the shield wire of the seismic probe.

✓ PT520 will supply power to appropriate sensors.

◆ For seismic sensors, a nominal 2.5mA constant current will be applied to the sensors.

Sensor Calibration Procedure

SENSOR Selection

✓   Press SENSOR , we can get two pages of display like this.

```
 SENSOR SELECT
NONE
ACCELERATION
VELOCITY   ICP
```

```
 SENSOR SELECT
VELOCITY   EM
NONE
NONE
```
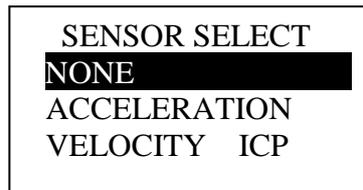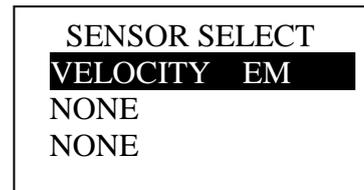
        First Page   Second Page

✓   Four types of sensors in two display pages. User can switch from one page to another page by rotating the Turner, and then press the Turner to confirm.

✓   When SENSOR SELECT is NONE, and press ENTER or rotation button, it will get out of SENSOR SELECT.

Input Sensor Sensitivity

✓   If it is an external acceleration sensor, LCD display will be like this.
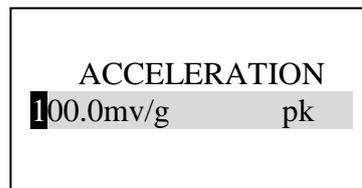
```
      ACCELERATION
100.0mv/g          pk
```

✓   If it is an external ICP velocity sensor, LCD display will be like this.

```
      VELOCITY   ICP
3.84 mv/mm/s       pk
```
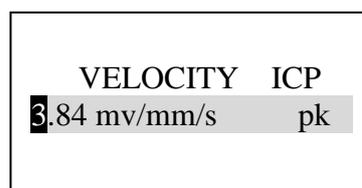
✓ If it is an external VELOCITY EM (electro-magnetic) velocity sensor, LCD display will be like this.

```
        VELOCITY    EM
3.84 mv/mm/s          pk
```

✓ Press the Turner to change number position, rotate the bar clockwise to increase the number, and vice versa. Press ENTER to confirm.

✓ If it is an external acceleration sensor, LCD display will be like this.

```
FREQ: 80.0 Hz
AMPI : 0.0 g  pk
AMPO: 0.0 g  pk
SENS: 0.0 mv/g pk
```

✓ If it is an external ICP velocity sensor, LCD display will be like this.

```
FREQ: 80.0 Hz
AMPI:    0.0  mm/s   pk
AMPO:  0.0  mm/s    pk
SENS:0.0mv/mm/s pk
```

✓ If it is an external EM (electro-magnetic) velocity sensor, LCD display will be like this.

```
FREQ: 80.0 Hz
AMPI: 0.0 mm/s  pk
AMPO: 0.0 mm/s  pk
SENS:0.0mv/mm/s pk
```

Frequency and Amplitude Setting

✓ Press FREQ and AMPL to set frequency and amplitude. Refer to previously section for setting. LCD display will be like this.

> FREQ: 80.0 Hz
> AMPI: 3.0 g pk
> AMPO: 3.0 g pk
> SENS: 100.2 g/mv pk

✓ With the above picture, FREQ is vibration frequency, AMPI is internal sensor vibration value, AMPO is external sensor vibration amplitude ①, SENS is the external sensor sensitivity ②.

$$\text{Amplitude①} = \frac{\text{Voltage Output}}{\text{Sensitivity}}$$

$$\text{Sensitivity②} = \frac{\text{Voltage Output}}{\text{AMPI}}$$

✓ Note: Please set measuring unit (English or Metric) before entering sensor calibration mode because it is impossible to switch measuring unit in sensor calibration mode. Press SENSOR to enter sensor calibration mode.

External Accelerometer Sensor test,it is advised to set to 80Hz@3.0g(PK).

External Proximity Sensor Test, it is advised to set to 80Hz@200um(PK-PK).

External velocity Sensor Test, it is advised to set to 80Hz@50mm/s(PK).

SOFTWARE OPERATION

PT520 Software Installation

PT520 Wiring Diagram for Calibration
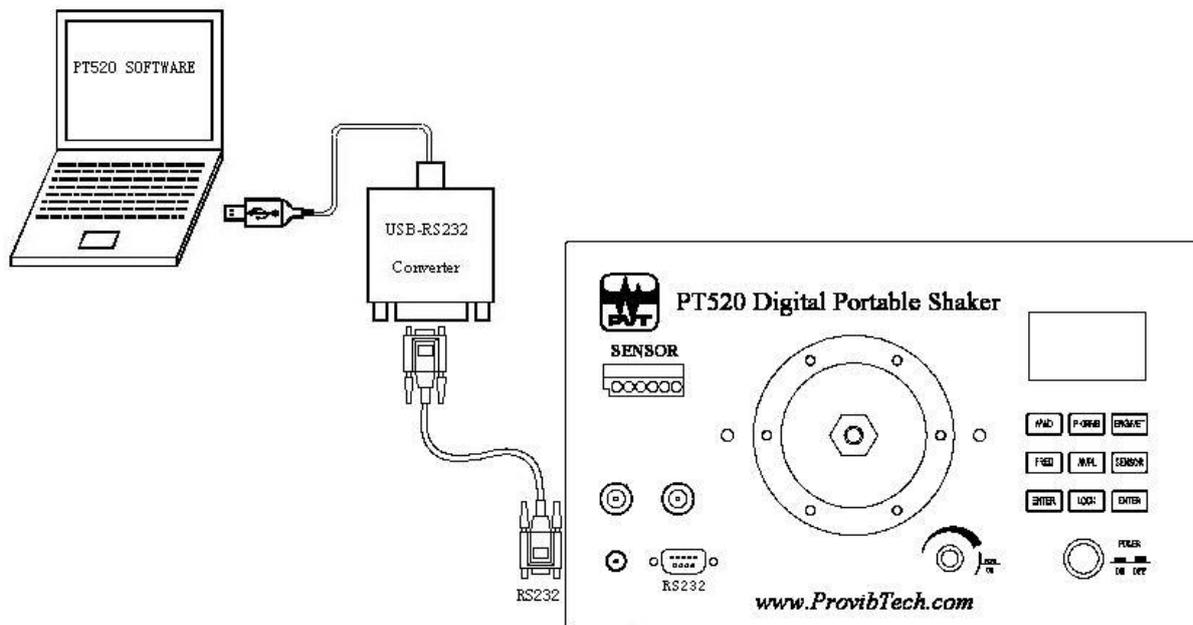
Fig.6-1

Installing PT520 Software

Please follow the steps below to install PT520 Software.

1. Put the PT520 Installation CD into the DVD-ROM. From the root folder, select "PT520-Setup" folder and then double click setup.exe from the root folder to start it. In window below, click **Next** button to continue the installation.
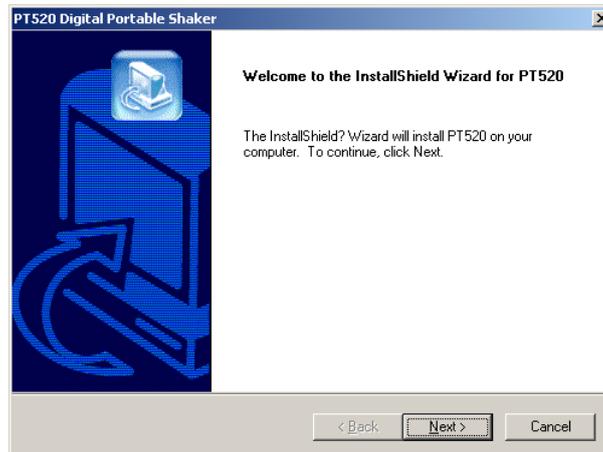
2. Select destination folder. Click **Browse** button to select the path. If you select "D:\Program Files", the Setup will automatically create folders "ProvibTech" and "PT520" beneath this path. And all files will be copied to the destination: "D:\Program Files\ProvibTech\PT520". Click **Next** button to continue the installation.
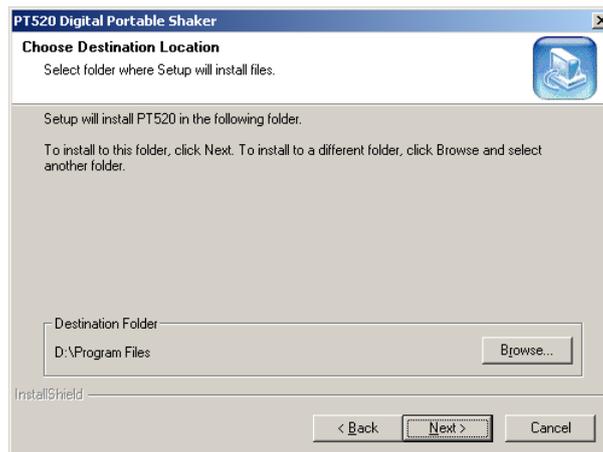
3. The Setup launches "Start Copying Files" window. Click **Next** button to continue the installation.
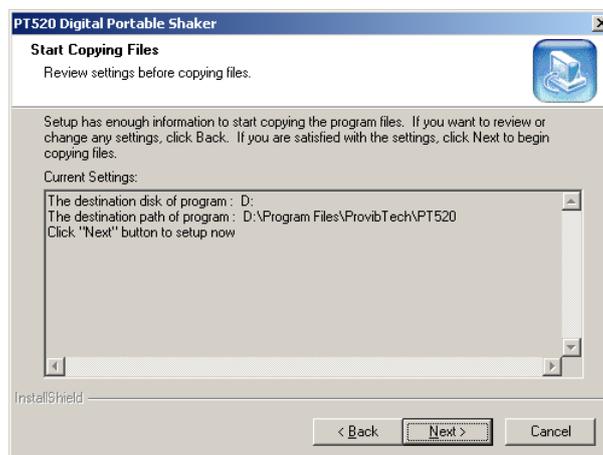
4. The Setup begins to copy files.

Installing:
D:\WINDOWS\system32\mfc42.dll

27%
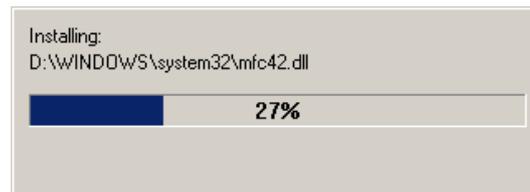
If "Locked File Detected" window is launched during the files copying, please mark "Don't display this message again" and then click **Ignore** button to continue the installation.

Locked File Detected

An option you selected requires that files be installed to or uninstalled from your system, or both. A locked file, D:\WINDOWS\system32\mfc42.dll, was found while performing the needed file operations. To leave this file as it is on your system, click the Ignore button; to retry the file operation, click Retry; or to perform the operation when your system is rebooted, click Reboot.

☑ Don't display this message again.

[Reboot] [Ignore] [Retry] [Cancel]

5. Installation finished. Click **Finish** button.

PT520 Digital Portable Shaker

InstallShield Wizard Complete

Setup has finished installing PT520 on your computer.

[< Back] [Finish] [Cancel]
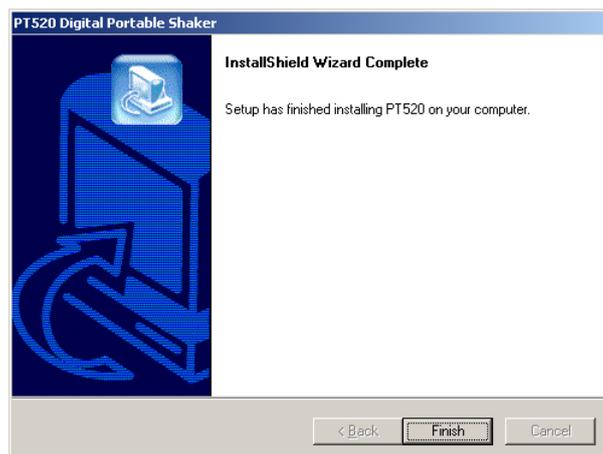
Installing USB-RS232 Converter Driver

Please follow the steps to load USB-RS232 converter driver.

1. Connect USB-RS232 Converter to a spare USB port on your computer. Put the PT520 Installation CD into DVD-ROM. The computer will launch "Found New Hardware Wizard" window. Select "No, not this time" and then click **Next** button.

2. In window below, select "Install the software automatically (Recommended)" and then click **Next** button.

3. The computer now begins to scan the installation file and then install the USB-RS232 converter driver.

Picture below shows the condition that the USB-RS232 converter driver hasn't been installed. To view the information, right click "My Computer" and select **Manage** command. In "Computer Management" window, navigate "Device Manager" and then select "Other devices/USB Serial Port".
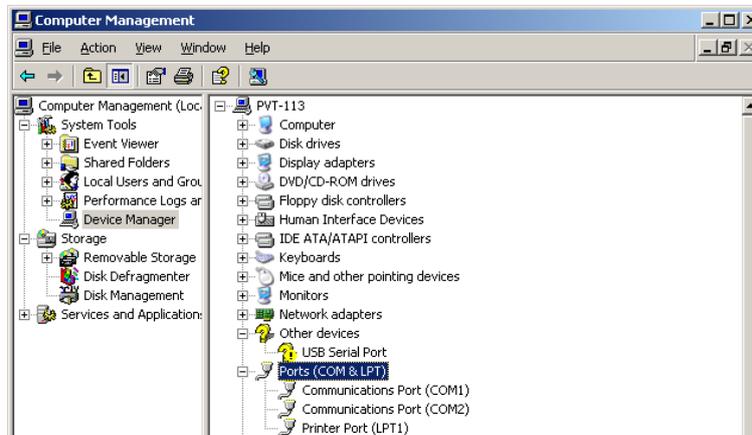
4. The installation of USB-RS232 converter driver was finished. Click **Finish** button.

After the USB-RS232 converter driver was installed, the computer will begin to install COM port. The installation process is the same as the installation of USB-RS232 converter driver mentioned above. After the two were installed, see picture below: a new USB Serial Port "COM3" is added beneath "Ports (COM&LPT)", and "USB Serial Converter" is added beneath "Universal Serial Bus controllers".
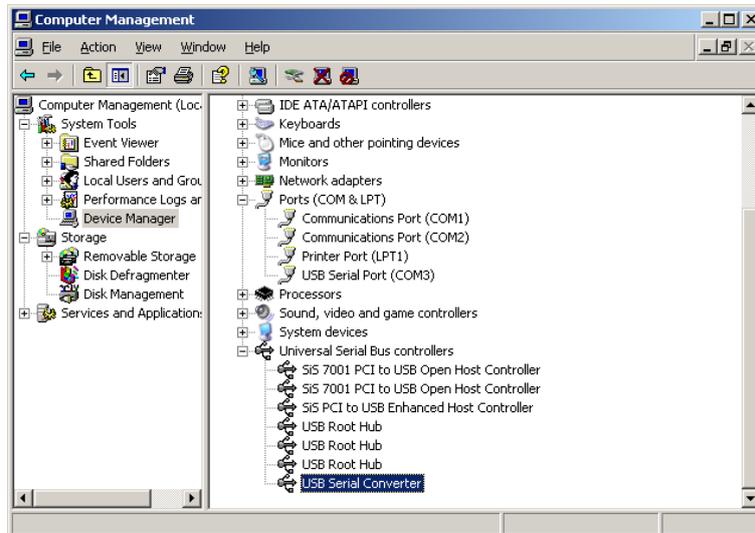
Uninstalling PT520 Software

Select Windows **Start**->**All Programs**->**PT520 Digital Portable Shaker**->**Uninstall PT520**. And then click **OK** button on "Confirm File Deletion" message box below.
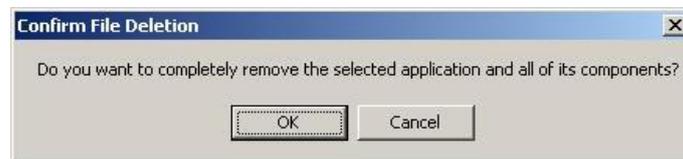
PT520 Software Operation

Start PT520 Software

Select Windows **Start**->**All Programs**->**PT520 Digital Portable Shaker**->**PT520**. If PT520 software failed to communicate with the PT520 Device that is connected to the local computer, "Error" window will be launched.

Under this condition, please check the following:

1. PT520 device is correctly connected to the local computer;
2. The Power Switch on PT520 device is turned on;
3. The USB-RS232 Converter driver is installed on local computer.

After you checked options listed above, click **OK** button on the "Error" window and then "COM Setting" window is launched.
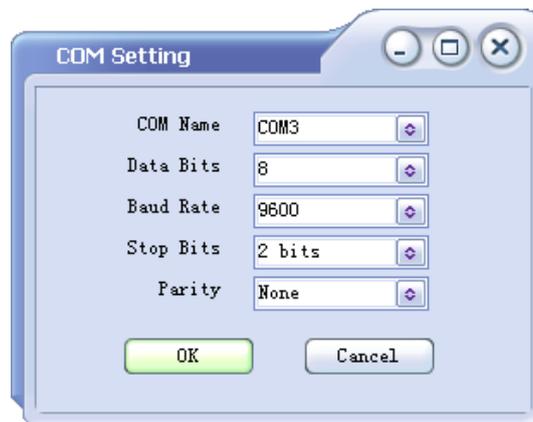
In window above, select the proper COM Port, Data Bits, Baud Rate, Stop Bits and Parity. Below are the default communication parameters.

✓ Data Bits: 8
✓ Baud Rate: 9600
✓ Stop Bits: 2 bits
✓ Parity: None

Follow the operation below to get the correct COM port. Right click "My Computer" and select **Manage** command. In "Computer Management" window, navigate "Device Manager" and then select "Ports (COM&LPT)". Find the option that starts with string "USB Serial Port" and get the correct COM Port.
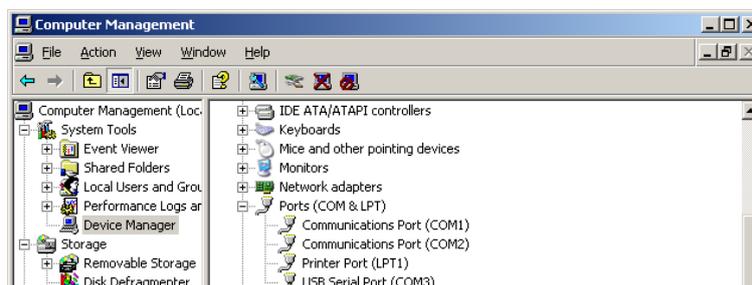
After the parameters are set, click **OK** button on "COM Setting" window, and then main window with **Reset** button is shown (see picture below).
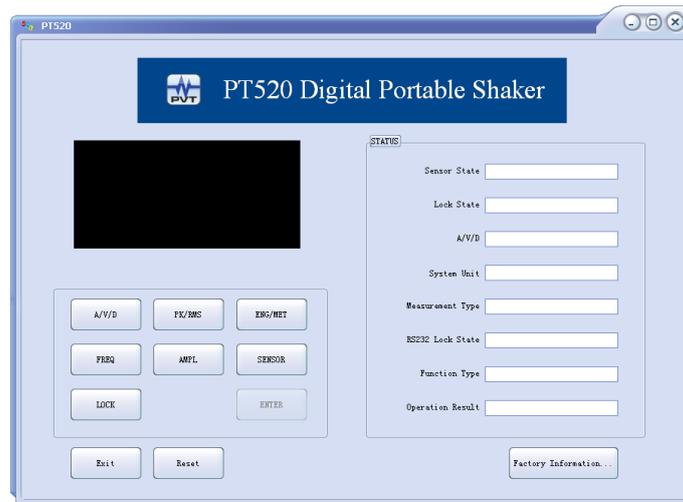
Click **Reset** button on the main window and software will re-connect to the PT520 device. If succeeded, the main window will be shown like following.

NOTE: If you want to set the communication parameters later, please click **Cancel** button on "COM Setting" window. See picture below: the main window with **Serial Port** button is shown.
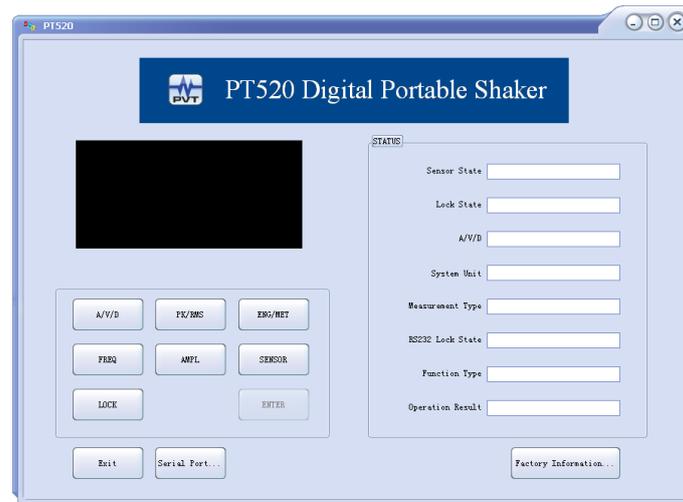
LCD Screen

- For PT520 device without external sensor:

The first line (Set Ampl) indicates the specified vibration amplitude; the second line (Ampi) indicates the actual vibration amplitude; the third line (Set Freq) indicates the specified working frequency.

- For PT520 device with external sensor:

The first line (Set Ampl) indicates the specified vibration amplitude; the second line (Ampi) indicates the actual vibration amplitude; the third line (Ampo) indicates the actual vibration amplitude of external sensor; the fourth line indicates the actual sensitivity of external sensor and measurement type (PK or RMS); the fifth line (Set Freq) indicates the specified working frequency.

Keyboard

● **A/V/D**

Click this button to set the type of the measured variable. Three options to select: Acceleration, Velocity, and Displacement. Select the type and then click **ENTER** button. If succeeded, the "Operation Result" field on main window will display "Succeeded in setting A/V/D!".
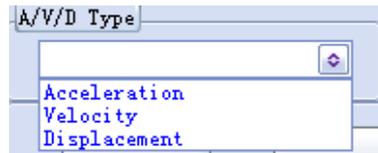
● **PK/RMS type**

Click this button to set the measurement type. Three options to select: PK, PK-PK, and RMS. Select a measurement type and then click **ENTER** button. If succeeded, the "Operation Result" field on main window will display "Succeeded in setting PK/RMS!".
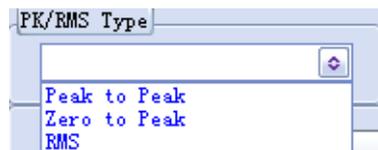
● **ENG/MET**

Click this button to set system unit. Select "English" or "Metric", and then click **ENTER** button. If succeeded, the "Operation Result" field on main window will display "Succeeded in setting ENG/MET!".
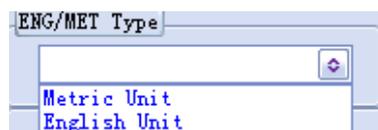
● **FREQ**

Click this button to set the working frequency. Input the frequency and then click **ENTER** button. If succeeded, the "Operation Result" field on main window will display "Succeeded in setting FREQ!" and meanwhile the "Set Freq" option shown on the third line of LCD Screen will be refreshed. The allowable range of frequency should be 30Hz to 2000Hz.

● **AMPL**

Click this button to set the vibration amplitude. Input the amplitude and then click **ENTER** button. If succeeded, the "Operation Result" field on main window will display "Succeeded in setting AMPL!" and meanwhile the "Set Ampl" option and "Ampi" option shown on the first line and second line of LCD Screen will be refreshed.

● **SENSOR**

Click this button to set parameters for external sensor. Select the sensor type first and then input the sensor's sensitivity, later click **ENTER** button.
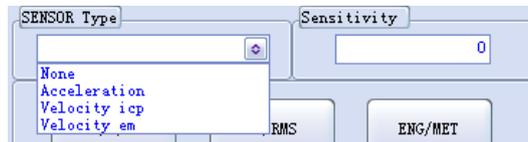
If succeeded, window below is launched and meanwhile the "Operation Result" field on main window will display "Succeeded in setting SENSOR!".

✓ **Frequency:** Set the working frequency. The allowable range of frequency should be 30Hz to 2000Hz.

✓ **Full Scale:** Set the full scale for amplitude. The full scale should be greater than zero.

✓ **Degree**: Set the times to measure the vibration amplitude and sensitivity of the external sensor. The range of degree should be 2 to 50.

✓ **Sensor Serial Number:** Input the serial No. of the connected sensor. This No. can be found on the sensor or the sensor cable.

✓ **Operator No.:** Input the operation No.
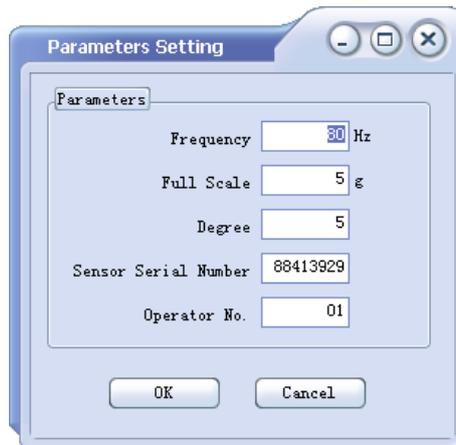
After parameters were set, click **OK** button. Software will record the actual vibration amplitude and sensitivity of the external sensor read from PT520 device, and presents them with list and diagram like picture below:
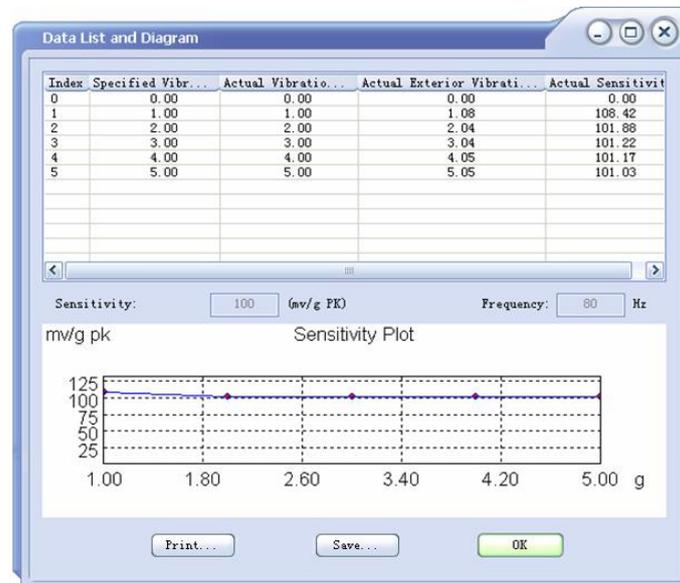
List: The second column presents the specified vibration amplitude; the third column presents the actual vibration amplitude; the fourth column presents the actual vibration amplitude of the external sensor; the fifth column presents the actual sensitivity of the external sensor.

Diagram: The x-coordinate presents the specified vibration amplitude; the y-coordinate presents the actual sensitivity of the external sensor.

Sensitivity: This field displays the specified sensitivity of external sensor.

Frequency: This field displays the specified working frequency.

Print: Click this button to print the list and diagram.

Save: Click this button to save the window by the format of a bmp file with size of 1000*1200 pixels. By default, the file will be named by the format of "Sensor-SNXX-YYYY(year)-MM(month)-DD(day) HH(hour).mm(minute).SS(second).bmp". Figure below shows a saved bmp file.
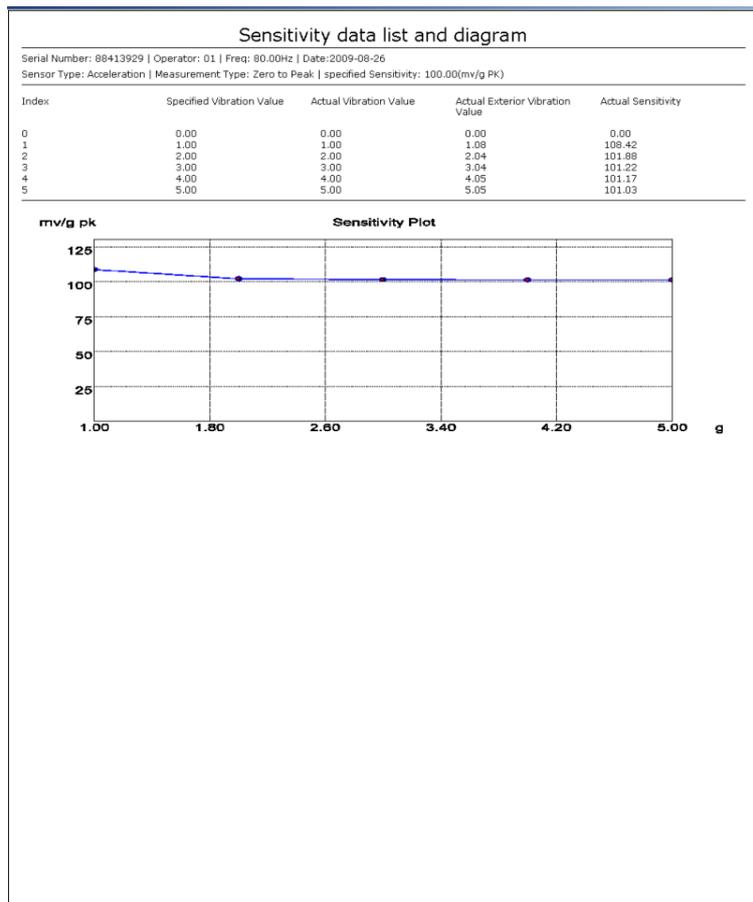
OK: Click this button to exit "Data List and Diagram" window.

● **LOCK or UNLOCK**

Click **LOCK** button to disable other buttons (expect **Exit** button) on keyboard and if succeeded, **LOCK** button will change to **UNLOCK** button.

Click **UNLOCK** button to enable the locked buttons on keyboard and if succeeded, **UNLOCK** button will change to **LOCK** button.

● **ENTER**

Click this button to download the current setting to PT520 device.

Other Buttons on Main Window

● **Exit**

Click this button to exit PT520 software.

● **Reset**

After you re-set the communication parameters on "COM Setting" window and meanwhile click **OK** button on the window, the **Reset** button will appear. Click **Reset** button to re-connect to the PT520 device. If succeeded, this button will disappear.

● **Serial Port**

On "COM Setting" window if you click **Cancel** button, the **Serial Port** button will appear. Click this button to re-launch "COM Setting" window.

Set correct communication parameters on "COM Setting" window, and then click **OK** button, later click **Reset** button to re-connect to the PT520 device.

● **Factory Information**

Click this button to launch "Factory Information" window. See picture below.

✓ **Serial Number:** Display the serial No. of the connected PT520 device.
✓ **Firmware Version:** Display the firmware version of the connected PT520 device.
✓ **Quality Assurance:** Display the No. of the quality assurance.

STATUS

- **Sensor State**

The content in this field indicates the state of the external sensor. If the external sensor is in work status, the field will show "Has Exterior Sensor". If the external sensor isn't in work status or there is no external sensor connected, the field will show "None".

- **Lock State**

Display "Locked" or "Unlock". "Locked" indicates that buttons expect **Lock** are locked while "Unlock" indicates that no buttons are locked.

- **A/V/D**

Display the type of measured variable.

- **System Unit**

Display the system unit: English or Metric.

- **Measurement Type**

Display the measurement type.

- **RS232 Lock State**

Display the state of the RS232 COM. "RS232 un-locked" indicates the COM isn't locked while "RS232 locked" indicates the COM is locked. Once the RS232 COM is locked, PT520 device can't communicate with the PT520 software.

- **Function Type**

Display the function of the connected PT520 device: "Entire function" indicates all functions are supported while "Single function" indicates sensor working frequency is fixedly set to 80 Hz and other functions are supported.

- **Operation Result**

Display operation result. If operation succeeded, the field will show "Succeeded in setting" plus the operation option.

Calibration Procedure with PT520 Device

Before the calibration, make sure the PT520 software can communicate with PT520 device.

1. Type Setting of Measured Variable

Click **A/V/D** button on main window and then select one type, and later click **ENTER** button.

2. Measurement Type Setting

Click **PK/RMS** button on main window and then select a measurement type and later click **ENTER** button.

3. System Unit Setting

Click **ENG/MET** button on main window and then select a system unit, and later click **ENTER** button.

4. Frequency Setting

Click **FREQ** button on main window and then type the frequency and later click **ENTER** button.

5. Amplitude Setting

Click **AMPL** button on main window and then type the amplitude and later click **ENTER** button.

6. Settings of External Sensor
   - ✓ Click **SENSOR** button on main window;
   - ✓ Select the sensor type and then type the sensitivity of the external sensor, and later click **ENTER** button;
   - ✓ If operation above succeeded, "Parameters Settings" window is launched. Type the frequency, full scale, degree, sensor SN, and operation No. in the related edit box. And then click **OK** button.

Parameters Setting

Parameters

Frequency	80	Hz
Full Scale	0	g
Degree	0	
Sensor Serial Number		
Operator No.		

OK   Cancel
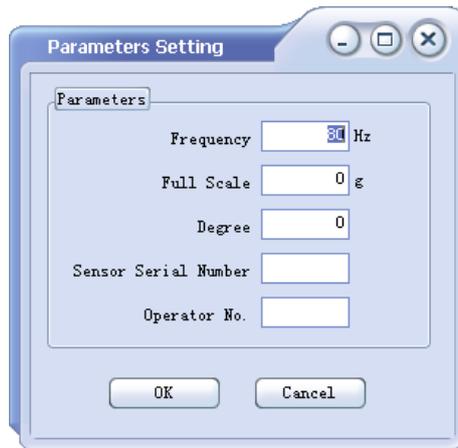
Later software will output the calibration list and diagram for the external sensor like picture below.

Data List and Diagram

Index	Specified Vibr...	Actual Vibratio...	Actual Exterior Vibrati...	Actual Sensitivit
0	0.00	0.00	0.00	0.00
1	1.00	1.00	1.08	108.42
2	2.00	2.00	2.04	101.88
3	3.00	3.00	3.04	101.22
4	4.00	4.00	4.05	101.17
5	5.00	5.00	5.05	101.03

Sensitivity: 100   (mv/g PK)   Frequency: 80   Hz

mv/g pk   Sensitivity Plot

125
100
75
50
25

1.00   1.80   2.60   3.40   4.20   5.00 g

Print...   Save...   OK
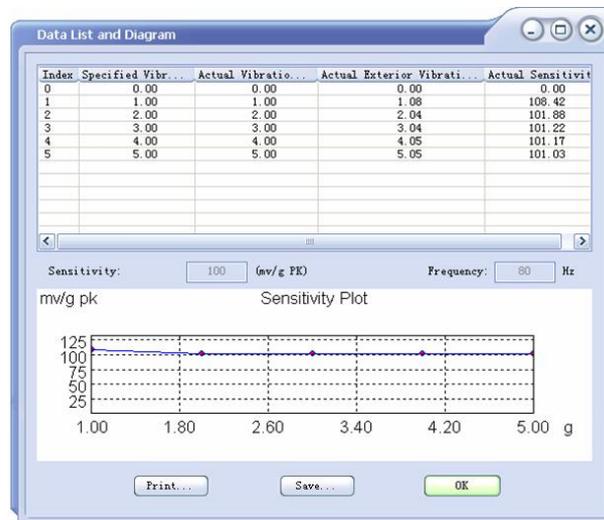
Maintenance and Ordering

Maintenance

1. Don't keep the shaker in high temperature, high humidity environment.
2. Keep the shaker clean.
3. Please position the PT520 on a flat and stable desktop or floor. When location is decline, it might cause unpredicted accidents.
4. Please don't make the shaker working at high amplitude status for a long time, it will reduce the lifecycle of the shaker.
5. It is recommend to have the shaker factory calibrated within a period of one year to maintain the specified accuracy.
6. For shipping the shaker, the aluminum bar that fix the shaker head on the shaker body should be mounted to protect the shaker head and the holding spring.

Order Information

PT520-AXX-BXX-CXX-DXX

AXX: Frequency

A00: Variable frequency

A01: Fixed 80 Hz

BXX: Sensor

B01: Seismic (accelerometer, velocity sensor and transmitter) and proximity probes

CXX: Automatic calibration

C00: With Seismic calibration (supply sensor power, and signal conditioning)

C01: No calibration

DXX: Software

D00: With software（include PT2060-009102 USB to RS-232 Converter with RS232 communication cable.）

D01: No software